THE EXTENT AND MAGNITUDE OF RELATIVE POVERTY IN RURAL AREA OF HIMACHAL PRADESH: A CASE STUDY OF MANDI DISTRICT

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Abstract: There are two broad concepts of poverty: relative poverty and absolute poverty. The relative poverty is measured in the terms of inequality in the distribution of income; whereas, absolute poverty is reckoned in terms of some kind of notion of substance considered appropriate to the circumstances of the country concerned. In developing countries where incomes are low; absolute poverty is generally reflected mainly in terms of inadequacy of food intake and the consequent undernourishment on the mass scale, though the definitions of substances appropriate to such countries might also include other essential minimum needs such as clothing, housing, fuel, light, education and health etc.[1]

Both relative and absolute poverty are closely aligned to inequality in income distribution. 'Relative Poverty' arises entirely as consequences of an unequal distribution of income irrespective of what the income level or the corresponding state of deprivation of the people at the bottom end of the income scale might be. 'Absolute Poverty' on the other hand, expresses a collective view on deprivation in its somewhat physical manifestation. Thus, wherever be the line any society chooses to draw to separate the deprivation from the relative comfort, those on the wrong side of the line are defined as poor irrespective of how comfortable or affluent the other may be. The fact is that the sense of deprivation among the poor may also depend on how wide is the gap between their income and the income of those who are not poor, is not a consideration relevant to the notion of absolute poverty, though it very much is the notion of relative poverty. Any measure of relative poverty is therefore, inextricably embedded in the measures of inequality, whereas, a determined standard or poverty line, which represent a socially acceptable minimum levels of living.[2]

Index Terms - **Relative, Inequality, Absolute and Deprivation.**

I. INTRODUCTION

The measurement of poverty involves two distinct problems. The first is the specification of 'Poverty Line' i.e. which should be the value of consumption basket considered to represent the socially accepted "Minimum" standard of living. Once the poverty line is determined, the second step is that of determining an index of poverty. In the present study, the poverty line has been determined on the basis of minimum nutrients required norms i.e. 2400 calories per consumer unit per day for the rural area and 2100 calories per consumer unit per day for urban area as has been suggested by the Government of India, Planning Commission[3] and Indian Council of Medical Research. The value of the minimum per consumer unit per day consumption basket (i.e. both out of home grown stock as well as out of purchases) has been calculated by multiplying the quantities of different food items by their respective actual prices prevailing in the sample area during the period of the investigation i.e. during the period of survey. The total number of male, female and children of varying ages have been converted into 'standard consumption units' or 'Adult Man Value' by applying the scale of co-efficient suggested by the Indian Council of Medical Research.[4] For the present empirical investigation district Mandi has been selected purposely from the rural areas of Himachal Pradesh. A sample of 300 households scattered over 12 villages in all selected development blocks of district Mandi have been selected randomly. The required information has been collected with the help of pre-tested scheduled from the sample households during the period of survey. In the present study absolute poverty has been worked out by converting minimum calorie-intake of 2400 per person in rural areas and 2100 per person in urban areas. Whereas, the extent of relative poverty has been analysed with the help of Head Count Ratio, Gini-coefficient, Lorenz Curve and Sen's Measure of 1973(Ps) and 1976(Ps*). The extent of poverty in any country depends upon two factors, the average level of income and the degree of inequality in its distribution. Chenery argues that poverty as a concept is closely related to wider inequalities in the distribution of assets and income and may be identified with unemployment. The inequalities of distribution tend to grow until the benefits of increased investment and technological progress are spread more widely and economic dualism is reduced.[5]

The weaker section of the society has remained in the grip of the various circles of poverty, unemployment and under employment, low income and low investment. They are the capital starved section of the rural population. They have very little or no productive assets and their meager income is derived from casual or irregular employment available in the villages. An improvement in their lot is believed to be largely dependent on the equal distribution of productive assets that will create greater employment opportunities and enhance their income levels. Various development programmes based on target group oriented approach, area approach and beneficiary oriented approach have been launched all over the country for the upliftment of the weaker section of the rural areas.[6]

Objectives
The present study has been undertaken with a view to estimate the extent and magnitude of relative poverty with respect to household productive assets, income and household consumption expenditure in the rural area of Mandi district in Himachal Pradesh by applying the Head Count Ratio, Gini-coefficient and Sen's measure of poverty of 1973 and 1976.

Methodology

Sampling
For the present empirical investigation district Mandi has been selected purposely from the rural areas of Himachal Pradesh. A sample of 300 households scattered over 12 villages in all selected development blocks of district Mandi have been selected randomly. The required information has been collected with the help of pre-tested scheduled from the sample households during the survey

Nature of Data Collected
With the help of pre-tested schedule information pertaining to age and sex-wise family composition, educational status, occupation of all sample households were recorded from 300 sample households, as it existed at the time of the survey.

The data pertaining to the value of household assets (i.e., both productive and durables) have been recorded as existed at the time of survey. Information to household income from different sources (i.e., services, business, household industries, wage works and other sources), income from livestock activities as well as necessary activities have been recorded during the month of survey. The information pertaining to farm income, income from horticultural product as well as the income earned from sale of assets have been recorded for the period preceding the survey. The information pertaining to household consumption of food-items (both of home produced and purchased) have been recorded during the period of survey and the information pertaining to the consumption of non-food items have been recorded during the period of survey.

Analytical Tools
The minimum nutritional requirements of 2400 calories per consumer unit per day as suggested by the planning commission[7]and Indian Council of Medical Research[8] for rural population, has been adopted as the dividing line between the 'poor' and 'not poor' in the present study. The sample of 300 households has been converted in standard consumer unit of adult man value by applying the scale of co-efficient suggested by the Indian Council of Medical Research. For example a family consisting of father, mother and three children aged 10, 8, 6 years has an adult man value of 3.9(i.e., 1.0+0.8+0.8+0.7+0.6)[9]. The value of minimum nutritional requirements, i.e. 2400 calories per consumer unit per month has been worked out to Rs. 105.36. this value of Poverty Index has been calculated by multiplying the quantities of different food-items by their respective prices prevailing in the sample area during the period of investigation. The per capita minimum calorie requirement of 2400 calories came out to Rs. 105.36.
In the present investigation the Poverty Index has also been calculated by giving due importance to per capita per month expenditure on food –items and non-food items. Therefore the ratio of expenditure on non-food items to the expenditure on food-items has been worked out Rs. 32.99. Thus, the value of Poverty Index based on per capita per month minimum food-items and non-food items requirements including the expenses has been worked out Rs. 203.40(i.e., Rs. 105.36 + Rs. 32.99 = Rs. 138.35). thus, those who are spending less than Rs. 138.35 per month on food-items and non-food items are termed as 'poor' and those spending more than 138.35 per month on food and non-food items are termed as 'not poor' in the present study.

Results and Discussion
In the present study the extent and magnitude of the relative poverty has been worked out with the help of 'Head Count Ratio', Lorenz Curve, Gini co-efficient as well as by applying the Sen's measures of poverty of 1973(Ps) and 1976(Ps*).
On the basis of ' head count ratio' i.e. H = 558.70/2358.90 = 0.2368 the percentage of poor among the sample households came out 23.68 percent. But the Head Count Ratio' method as measure of poverty, is completely insensitive to the extent of the aggregate shortfall in income from the poverty line as well as to the distribution of income amongst the poor. The Gini-coefficient (or Lorenz Curve as it is frequently called) measures the distance between the diagonal(i.e., OBA in Figure- I).
Therefore, in the present study, the extent of inequalities in the distribution of household productive assets, income and consumption expenditure among the 'poor', 'not poor' and 'all households' of different holdings has been worked out with the help of Lorenz Curve and Gini-coefficient by calculating the cumulative percentages and by assigning proper weights to the above variables.

Distribution of Household Productive Assets among All the Farmers

The cumulated percentages of productive assets as well as number of persons falling among all the holding groups together have been with the help of Gini-coefficient:

$$G(a) = 1 + \frac{1}{2358.90} - \frac{2}{(2358.90)^2 \, 43458.77} (96052415181.03)$$

$$= 1 + 0.0004239264 - \frac{2}{2921102063098} (\, 96052415181.03 \,)$$

$$= 1.0004239264 - 0.0000000000083 (\, 96052415181.03 \,)$$

$$= 1.0004239264 - 0.794404752$$

$$= 0.2060191744$$

$$= 0.2060$$

The value of the Gini-coefficient of the distribution of household productive assets among all the sample households came out 0.2060.

Distribution of Household monthly Income among All the Sample Farmers

The cumulated percentage of the household monthly income as well as the number of persons falling in each income group among all the holding groups together have been calculated with the help of Gini-coefficient as below:

$$G(Y) = 1 + \frac{1}{2358.90} - \frac{2}{(2358.90)^2 \, 5249.62} (11818752988.66)$$

$$= 1 + 0.000423926 - \frac{2}{2921102063098} (\, 11818752988.66 \,)$$

$$= 1.0004239264 - 0.000000000068 (\, 118152988.66 \,)$$

$$= 1.0004239264 - 0.809198223$$

$$= 0.191225704$$

$$= 0.1912$$

The value of the Gini-coefficient of the distribution of household monthly income among all the sample households came out 0.1912.

Distribution of Household Monthly Income among the Poor Households

The cumulated percentages of the household monthly income of the poor as well as the number of poor persons have been calculated with the help of Gini-coefficinet as below:

$$G(y) = 1 + \frac{1}{558.70} - \frac{2}{(558.70)^2 \, (1299.09)} (177581002.05)$$

$$= 1 + 0.001789869 - \frac{2}{405505665.1} (177581002.05)$$

$$= 1.001789869 - 0.00000000493 (\, 177581002.05 \,)$$

$$= 1.001789869 - 0.875849673$$

$$= 0.125940196$$

$$= 0.1259$$

The value of the Gini-coefficient of the distribution of household monthly income among the poor came out 0.1259.

The value of the Gini-coefficient of the distribution of household monthly income among all the sample households (i.e., 0.1912) if compared to the value of the Gini-coefficient of the distribution of household monthly income among the poor (i.e., 0.1259) clearly indicates that the inequality of income is higher to the former case as compared to latter because in the former case comparatively the value of of Gini-coefficient is higher which shows relatively more skewed income distribution. The income of the poorest among the poor is low due to their un-economic size of holdings, higher percentage of dependents and lack of regular non-farm employment opportunities.

$$G(C) = 1 + \frac{1}{2358.90} - \frac{2}{(2358.90)^2 \, (1942.70)} (4250735862.15)$$

$$= 1 + 0.0004239264 - \frac{2}{10809990182.48} (4250735862.15)$$

$$= 1 + 0.0004239264 - 0.00000000019 (4250735862.15)$$

$$= 1.0004239264 - 0.786445832$$

$$= 0.2139780943$$

$$= 0.2140$$

The value of the Gini-coefficient of the distribution of household monthly consumption expenditure on Food and Non-food items came out 0.2140 which shows less inequality.

The value of the Gini co-efficient for the distribution of household total consumption expenditure on both food and non-food items among all the farmers has been worked out 0.2140. The value of Gini-coefficient for the household consumption expenditure on food-items alone among all the sample households has came out relatively lower, i.e. 0.1638 which clearly indicates that the extent of inequalities in the distribution of household consumption expenditure on food items is relatively smaller as compared to the extent of inequalities in the distribution of household consumption expenditure on non-food items. This clearly indicates that the distribution of consumption expenditure on non-food items is more skewed than the distribution of household consumption expenditure on food-items. Further, the distribution of household monthly total consumption expenditure is more skewed among the large farmers as compared to the marginal, small and medium farmers. This happened mainly due to the reason that the people falling in the higher income groups as well as larger size of holding groups spend comparatively less on food items and more on non-food items.

Sen's Measure of Poverty

The Gini-coefficient is more opaque since it measures the distance between the Diagonal (the line of equal distribution) and the Loren Curve. Unlike in Lorenz comparisons, the Gini-coefficient comparisons are always conclusive since one real number must be greater than, equal to or less than another. These are measures of relative poverty. The results of poverty based on these measures provides scope for public policy being concerned with the relatively poor, ignoring the poorest among the poor.

The poverty measures have been modified by A.K. Sen (1973)[10] by taking into account the following two factors: (i) We should be concerned not merely with the number of people below the poverty line but also with the amounts by which the income of the poor fall short of the specified poverty level(ii) The bigger the shortfall from the poverty level, the greater should be weight per unit of that shortfall in the poverty measures.

$$Ps = \frac{2}{(114+1)(300 \times 1766.44)} (3280314.37)$$

$$= \frac{2}{(115)(529932)} (3280314.37)$$

$$= \frac{2}{60942180.00} (3280314.37)$$

$$= (0.000000032818)(3280314.37)$$

$$Ps = 0.1077$$

Thus, according to Sen's measure of poverty (1973), 10.77 percent of the total sample households are falling below the poverty line.

$$Ps^* = 0.2368 \left[1 - \frac{1299.10}{1766.44} + \frac{1299.10}{1766.44} \times 0.1259 \right]$$

$$= 0.2368 [1 - 0.7354 + 0.7354 \times 0.1259]$$
$$= 0.2368 [1 - 0.7354 + 0.09259]$$
$$= 0.2368 [1 - 0.82799]$$
$$= 0.2368 (0.1720)$$
$$= 0.0407$$

Thus, in the present study according to Sen's measure of poverty (1976) the percentage of poor amongst the poor falling below the poverty line came out 4.10 per cent.

A diagrammatic representation of G and Ps* is provided in Figure-I where line OBA is the Lorenz Curve while OA is the line of Equal Distribution. The Gini-coefficient (G), is given by area OBA divided by area OKA. If the poor are defined as those whose income falls short of specific level. Then Fig. VIII.12 which has been drawn after Sen, the poverty measure is roughly represented by the shaded area OCB, where the slope of OE represents the poverty level, normalized in percentage units, and OQ is the number of the poor. The poverty measure (Ps*) can be seen to correspond to area OBC divided by area OQG, it differs from Gini-coefficient (Area OBA) which is a measure of 'relative' inequalities into two ways, viz; (a) in being concerned only with the people who lie below the poverty line (leaving out area DCBA) and (b) in calculating the income differences from poverty level and not from the average income of the distribution itself (leaving out area (ODC).

Thus, Ps* measure leaves out of reckoning the area ODC as well as the area DCBA and corresponds to the area OCB divided by area OQG. The value of the Ps* has been worked out to be 0.041 which is the value of the area OCB in Figure VIII.12. on the other hand it differs from the standard poverty measure q, represented in Figure-1 by OQ, in being sensitive to both the size of income gaps of the poor and in putting more weight on the relatively poorer;
(a)   by noting their larger income gaps as well as
(b)   by putting in greater weight per units of their income gaps.

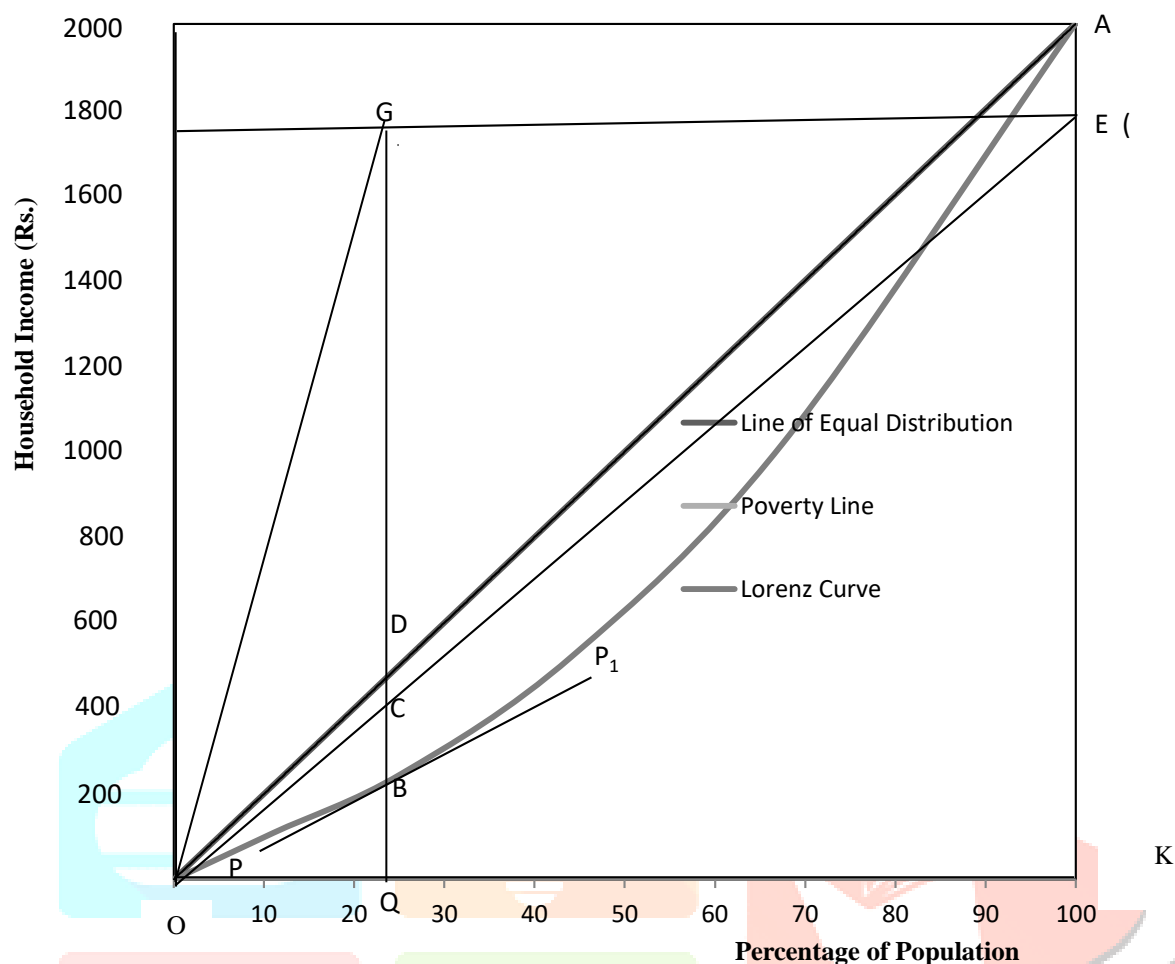**Extent of Relative Poverty Among the Sample Households**

Figure – I

Thus, Ps* (Sen's measure of poverty 1976) is superior to both the usual ' head count ratio' as well as to the standard measure of 'relative inequality' (Gini-coefficient).Thus, the value of the poverty estimates with the help of different poverty measures, i.e. 'head count ratio' (H), Gini-coefficient and Sen's measure of poverty 1973 and 1976 which is Ps and Ps* respectively are evident from table 1.

Table 1 Relative Poverty Estimates with the Help of Different Positive Measures

Sr. No.	Poverty Measure	Percentage of Poor
1	Head Count Ratio	23.68
2	Gini - Coefficient for poor (G)	12.59
3	Sen's Measure of Poverty 1973 (Ps)	10.77
4	Sen's Measure of Poverty 1976 (Ps*)	4.10

The value of poverty estimates varies with the help of different measures. But in the present context Ps* is considered more reliable as both the distribution of income among the poor as well as the extent of the aggregate shortfall in income from the poverty line has been taken into account.

While, Ps* measure is closely aligned to the Gini coefficient, it has two distinguished features:

(1)   it covers only a part of the distribution.

(2)   it is an absolute measure.

The latter makes an unambiguous welfare judgment possible, but the former renders it 'incomplete' so far as the distribution is concerned. However, this measure (Ps*) will be reliable only if it will be treated as though it were complete on the grounds that the principal welfare concern of the society relates to that section of the society which the Ps* measure represents.

Thus, it can be concluded that the estimates of poverty among the sample households so arrived with the help of 'normative approach' and Ps* (Sen's measure of Poverty(1976) among the positive measures are more suitable, realistic and reliable from the welfare and policy point of view for improving the socio-economic conditions of the sample households of district Mandi.

APPENDIX

For working out the Head Count Ratio, Gini-coefficient and Sen's measures of Poverty the following formulas are used:

(1) Head Count Ratio (H)

Let Z be the poverty line, and Yi be the income of the ith person with income arranged in ascending order so that $Y_i \leq Y_i + i$ for all i, Let ' n' denotes the total number of people in the community and 'q *' the number of people below poverty line. The Head Count Ratio (H) is then

$$H = \frac{q^*}{N} = q$$

(2) Gini- Coefficient

Gini-coefficient is used to attach some absolute measures to the degree of inequality or to give some idea whether the inequality is large or small. Gini-coefficient is not purely statistical and it embodies implicit judgment about the weight to be attached to inequality at different points on the income scale. This co-efficient may be interpreted in two ways. First, it may be seen geometrically in terms of Lorenz Curve.

$$\text{Gini - Coefficient} = \frac{\text{Area between Lorenz Curve \& Diagonal}}{\text{Total Area under Diagonal}}$$

The co-efficient may be seen to range from zero when income is equal (Lorenz curve follows the diagonal) to one and at the other extreme (the Lorenz curve have > shape), Secondly, it has computed mathematically as follows.[8]
The value of Gini-coefficient for the income distribution of sample households has been worked out as follows:

$$G(Y) = 1 + \frac{1}{n} - \frac{2}{n^2 Z} \sum_{i=1}^{n} (n+1-i) \, Y_i$$

Where

G(Y)	=	Gini co-efficient of the income distribution of sample households
n	=	Population size
z	=	mean value of income
Yi	=	Income of the ith person

The value of the Gini-coefficient of the income inequalities among the poor has been calculated with the help of following formula:

$$G(Y) = 1 + \frac{1}{q} - \frac{2}{q^2 Z} \sum_{i=1}^{n} (q+1-i) \, Y_i$$

Where

G (Y)	=	Gini co-efficient of the income distribution of the poor
z	=	mean income of the poor
q	=	number of people below poverty line
Yi	=	Income of the poor man

The value of the Gini co-efficient for the distribution of sample household expenditure on food items by the sample households has been work out as follows:

$$G(C) = 1 + \frac{1}{n} - \frac{2}{n^2 Z} \sum_{i=1}^{n} (n+1-i) \, C_i$$

Where ,	G (C)	=	Gini co-efficient of the consumer expenditure on food items
	n	=	total consumer units
	z	=	mean consumption expenditure
	Ci	=	consumption on food items by the ith person

The value of Gini- coefficient for the assets distribution among the sample household has been workout as follows:

$$G(C) = 1 + \frac{1}{n} - \frac{2}{n^2 Z} \sum_{i=1}^{n} (n+1-i) \, a_i$$

where	G(a)	=	Gini co-efficient of the assets distribution
	n	=	total number of households
	z	=	mean value of assets distribution
	ai	=	value of the assets of the ith person

(3) Sen's Measure of Poverty

The poverty measures have been modified by A.K. Sen (1973)[11] by taking into account the following two factors.

We should be concerned not merely with the number of people below the poverty line but also with the amounts by which the incomes of the poor fall short of the specified poverty level; and the bigger the short fall from the poverty level, the greater should be the weight per unit of that short fall in the poverty measures. In the present study, the poverty measure suggested by Sen (1973) has been applied in order to find out the number of poor households falling below the poverty line as well as the extent of poverty with the help of following formula:

$$Ps = \frac{2}{(q^*+1)\,nz} \sum_{i=1}^{q^*} (Z - Yi)\,(q^*+1-i)$$

Where

Ps	=	Sen's measure of Poverty (1973)
q*	=	Number of households falling below the poverty line
n	=	Total number of sample households
z	=	The value of poverty index (Rs)

Sen (1976) though in the same general tradition, presented a somewhat different formulation of the poverty measures (Ps*) for large number of poor which has also been applied as under:

$$Ps^* = H\left(1 - \frac{\bar{Y}}{Z} + \frac{\bar{Y}}{Z}\,G\right)$$

Where,

Ps*	=	Sen's measure of poverty (1976)
H	=	Head Count Poverty Ratio
$\bar{Y}$	=	Mean income of the poor (Rs)
Z	=	Value of the Poverty Index (Rs)
G	=	Gini co-efficient of income distribution of the poor.

(4) Lorenz Curve

Income inequalities in different groups of sample households have been examined with the help of Lorenz curve. In Lorenz technique, the size of items and the frequencies are both cumulated and taking the total as 100, percentage, are calculated for the various cumulated values. These percentages are plotted on a graph paper. If there is proportionally equal distribution of the frequencies over various values of a variate, the points would lie in a straight line. This line is called 'line of equal distribution'. If the distribution of items is not proportionally equal, it indicates variability, and the curve would be away from the line of equal distribution. The farther the curve is from the line, the greater is variability in the series. A higher Lorenz curve implies more social welfare for the same total of income. The main drawback of Lorenz curve that it does not give any qualitative / numerical value of the extent of inequality. It merely gives a picture of the extent to which a series is pulled away from an equal distribution. It serves as a supplement and should be used along with some quantitative measures of inequality.

References

1. Department of Economics and Social Affairs, *Poverty Unemployment and Development Policy: A Case Study of Selected Issues with Reference to Kerala*, United Nation, New York, 1975, p.7.

2. I.Z. Bhatty, *Inequality and Poverty in Rural India, in Poverty and Income Distribution* edited T.N. Srinivaasan and P.K. Bardhan, Statistical Publishing Society, Calcutta, 1974, p. 292.

3. Government of India, *Draft Ffifth Five Year Plan 1978-83*, Planning Commission, New Delhi, Vol- II, , 1978, p. 36.

4. C.Gopalan, B.V. Ramashastri and S.C. Balasubramanian, *The Nutritive Value of Indian Foods*, The Indian Council of Medical Research, Hyderabad, 1980, p.10.

5. Hollis Chenery, *Structural Change and Development Policy,* Published for World Bank, Oxford University Press, New York,1979, pp. 20- 21.

6.   Government of India, *Manual on Integrated Rural Development Programme*, New Delhi, 1980, p.4.

7.   Government of India, Draft Fifth Five Year Plan, 1978-83, Vol.II, Planning Commission, New Delhi, 1978, p.36.

8.   C.Gopalan, B.V. Ramashastri and S.C. Balasubramanian, *The Nutritive Value of Indian Foods*, The Indian Council of Medical Research, Hyderabad, 1980, p.10.

9.   C.Gopalan, B.V. Ramashastri and S.C. Balasubramanian, *The Nutritive Value of Indian Foods*, The Indian Council of Medical Research, Hyderabad, 1980, p.10.

10.   Amartya Sen, *Poverty, Inequalities and Unemployment, Some Conceptual Issues in Measurement, in Poverty and Income***Distribution in India**, ed., T.N. Srinivasan and P.K. Bardhan, Statistical Publishing Society, Calcutta, 1974, p. 62-81.

11.   A.K. Sen, *Poverty*, *Inequality and Unemployment*, Economic and Political Weekly, special number, 1973, reprinted in *Poverty andIncome Distribution,* T. N. Srinivasan and P.K. Bardhan, Statistical publishing society, Calcutta, 1974, pp. 67 -83.